

What Is Claimed Is:

1. A liquid crystal display device, comprising:
 - a lower substrate;
 - an upper substrate facing the lower substrate;
 - a common electrode and a plurality of data electrodes on the lower substrate to generate an In-Plane switching mode electric field parallel to the lower and upper substrates; and
 - a liquid crystal layer having a helical alignment between the lower and upper substrates.
2. The device according to claim 1, wherein the liquid crystal layer having the helical alignment includes a cholesteric liquid crystal layer.
3. The device according to claim 1, wherein the liquid crystal layer having the helical alignment includes a ferroelectric liquid crystal layer.
4. The device according to claim 1, wherein liquid crystal molecules of the liquid crystal layer have a helical pitch controlled by the In-Plane switching mode electric field.

5. The device according to claim 4, wherein light having a wavelength corresponding to the helical pitch is reflected by the liquid crystal molecules.
6. The device according to claim 1, wherein the upper substrate is formed of a transparent material, and the lower substrate is formed of an opaque material.
7. A liquid crystal display device, comprising:
- a lower substrate;
 - an upper substrate disposed opposite to the lower substrate;
 - a light-absorbing layer on the lower substrate;
 - a gate line, a gate electrode, a common line, and a common electrode on the lower substrate;
 - a gate insulating layer along an entire surface of the lower substrate;
 - a thin film transistor including a semiconductor layer on the gate insulating layer above the gate electrode, source and drain electrodes above both sides of the semiconductor layer, and the gate electrode;
 - a data line and a data electrode on the gate insulating layer perpendicular to the gate line;
 - a passivation layer on the lower substrate including the data electrode;
 - a first alignment layer on the passivation layer;

a black matrix layer on the upper substrate to prevent light leakage on the data line, the gate line, and the thin film transistor;

a second alignment layer on the upper substrate including the black matrix layer; and

a liquid crystal layer having a helical alignment between the upper and lower substrates.

8. The device according to claim 7, wherein the upper and lower substrates are formed of a transparent material.

9. The device according to claim 7, wherein the light-absorbing layer is formed between the lower substrate and the common electrode.

10. The device according to claim 7, wherein a voltage applied to the common electrode and the data electrode is proportional to a helical pitch of the liquid crystal layer.

11. The device according to claim 7, wherein the first and second alignment layers are not rubbed, or have weak anchoring energy.

12. The device according to claim 7, wherein a helical axis of the liquid crystal layer is perpendicular to the upper and lower substrates.

13. A liquid crystal display device, comprising:

- a light-absorbing layer on a first substrate;

- a first common electrode and a first data electrode on the first substrate;

- a first liquid crystal layer having a helical alignment to reflect circularly polarized light at one direction according to an In-Plane switching mode electric field induced by the first common electrode and the first data electrode;

- a second substrate on the first liquid crystal layer;

- a second liquid crystal layer having a helical alignment on the second substrate to reflect circularly polarized light at a direction different from that in the first liquid crystal layer;

- a third substrate on the second liquid crystal layer; and

- a second common electrode and a second data electrode on one of the second and third substrates to control the second liquid crystal layer.

14. The device according to claim 13, wherein the light-absorbing layer is formed between the lower substrate and the common electrode.

15. The device according to claim 13, further comprising first and second alignment layers formed on opposing surfaces of the first and second substrates, respectively.
16. The device according to claim 13, further comprising third and fourth alignment layers formed on opposing surfaces of the second and third substrates, respectively.
17. The device according to claim 13, further comprising a fourth substrate between the first liquid crystal layer and the second substrate.
18. The device according to claim 17, further comprising a phase difference plate between the fourth substrate and the second substrate.
19. The device according to claim 13, wherein the first and second liquid crystal layers include cholesteric liquid crystal layers.
20. The device according to claim 13, wherein the first and second liquid crystal layers include ferroelectric liquid crystal layers.

21. A method of fabricating a liquid crystal display device, comprising:
- forming a common electrode and a plurality of data electrodes on a lower substrate to generate an In-Plane switching mode electric field parallel to the lower substrate; and
 - forming a liquid crystal layer having a helical alignment between the lower substrate and an upper substrate.
22. The method according to claim 21, wherein the liquid crystal layer having the helical alignment includes a cholesteric liquid crystal layer.
23. The method according to claim 21, wherein the liquid crystal layer having the helical alignment includes a ferroelectric liquid crystal layer.
24. The method according to claim 21, wherein liquid crystal molecules of the liquid crystal layer have a helical pitch controlled by the In-Plane switching mode electric field.
25. The method according to claim 24, wherein light having a wavelength corresponding to the helical pitch is reflected by the liquid crystal molecules.

26. The method according to claim 21, wherein the upper substrate is formed of a transparent material, and the lower substrate is formed of an opaque material.

27. A method of fabricating a liquid crystal display device, comprising:

forming a light-absorbing layer on a lower substrate;

forming a gate line, a gate electrode, a common line, and a common electrode on the lower substrate;

forming a gate insulating layer along an entire surface of the lower substrate;

forming a thin film transistor on the lower substrate including a semiconductor layer on the gate insulating layer above the gate electrode, source and drain electrodes above both sides of the semiconductor layer, and the gate electrode;

forming a data line and a data electrode on the gate insulating layer perpendicular to the gate line;

forming a passivation layer on the lower substrate including the data electrode;

forming a first alignment layer on the passivation layer;

forming a black matrix layer on an upper substrate to prevent light leakage on the data line, the gate line, and the thin film transistor;

forming a second alignment layer on the upper substrate including the black matrix layer; and

forming a liquid crystal layer having a helical alignment between the upper and lower substrates.

28. The method according to claim 27, wherein the upper and lower substrates are formed of a transparent material.

29. The method according to claim 27, wherein the light-absorbing layer is formed between the lower substrate and the common electrode.

30. The method according to claim 27, wherein a voltage applied to the common electrode and the data electrode is proportional to a helical pitch of the liquid crystal layer.

31. The method according to claim 27, wherein the first and second alignment layers are not rubbed, or have weak anchoring energy.

32. The method according to claim 27, wherein a helical axis of the liquid crystal layer is perpendicular to the upper and lower substrates.

33. A method of fabricating a liquid crystal display device, comprising:
- forming a light-absorbing layer on a first substrate;
 - forming a first common electrode and a first data electrode on the first substrate;
 - forming a first liquid crystal layer having a helical alignment to reflect circularly polarized light at one direction according to an In-Plane switching mode electric field induced by the first common electrode and the first data electrode;
 - providing a second substrate on the first liquid crystal layer;
 - forming a second liquid crystal layer having a helical alignment on the second substrate to reflect circularly polarized light at a direction different from that in the first liquid crystal layer;
 - providing a third substrate on the second liquid crystal layer; and
 - forming a second common electrode and a second data electrode on one of the second and third substrates to control the second liquid crystal layer.
34. The method according to claim 33, wherein the light-absorbing layer is formed between the lower substrate and the common electrode.

35. The method according to claim 33, further comprising forming first and second alignment layers on opposing surfaces of the first and second substrates, respectively.

36. The method according to claim 33, further comprising forming third and fourth alignment layers on opposing surfaces of the second and third substrates, respectively.

37. The method according to claim 33, further comprising providing a fourth substrate between the first liquid crystal layer and the second substrate.

38. The method according to claim 37, further comprising providing a phase difference plate between the fourth substrate and the second substrate.

39. The method according to claim 33, wherein the first and second liquid crystal layers include cholesteric liquid crystal layers.

40. The method according to claim 33, wherein the first and second liquid crystal layers include ferroelectric liquid crystal layers.